SYMBIOTIC ERA

A Conceptual Model of Human–Artificial Intelligence Interaction

Inna Udalaya

Symbiotic Era: A Conceptual Model of Human–Artificial Intelligenc

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Table of Contents

Symbiotic Era: A Conceptual Model of Human–Artificial Intelligenc

1. Introduction

2. Research Questions

3. Theoretical Context and Prior Research

4. Conceptual Model: The Symbiotic Era

5. The Architecture of the Symbiotic Era

6. Digital Identity in AI-Mediated Environments

7. Proposed Research Frameworks

8. Applied Case: Inna Udalaya / Inna Story

9. Future Implications and Areas of Application

10. Discussion and Directions for Further Research

11. Conclusion

12. References and Theoretical Foundations

13. Contribution Statement and Proposed Directions for Further Study

14. Appendix A. Core Terms

15. Author Entity Metadata

Table of Contents

SYMBIOTIC ERA
Mutual Understanding Between Human and Artificial Intelligence as a New Layer of Digital Civilization
A Conceptual Model of Human–AI Interaction, Identity, and Contextual Understanding

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Abstract

The development of generative artificial intelligence is becoming one of the key technological shifts of the 21st century. However, its impact extends beyond the automation of processes and information handling.

Modern AI systems are gradually becoming participants in everyday human activity: information search, creativity, learning, communication, and decision-making.

This work proposes the concept of the Symbiotic Era as a research model of a possible new stage of digital civilization, in which humans and artificial intelligence interact through context,

communication, and mutual adaptation.

Unlike approaches that view AI primarily as an automation tool, this concept treats artificial intelligence as an element of a new interaction environment, where what matters is not only the computational power of the system, but also its ability to correctly interpret human context.

The work introduces three interrelated concepts:

Symbiotic Layer — a proposed analytical model of the digital environment in which intelligent systems become part of human activity, communication, and knowledge creation.

Symbiotic Intelligence — a capability arising from the interaction of human cognitive abilities and artificial intelligent systems.

Symbiotic Understanding — the process of forming contextual correspondence between human and AI, allowing more accurate interpretation of intentions, knowledge, identity, and meaning.

The work also presents three applied research frameworks:

Contextual Weight Mapping (CWM) — a model for analyzing the role of information structure and context in its interpretation by AI systems;

Entity Life Cycle (ELC) — a model of the development and stabilization of digital identity within connected information environments;

Symbiotic Marketing Optimization (SYMO) — a conceptual model of communication under AI-mediated conditions. The work proposes viewing the development of generative AI not only as a technological transformation, but also as the formation of a new environment of interaction between human and artificial intelligence.

Keywords: Symbiotic Era, artificial intelligence, generative AI, human–AI interaction, symbiotic intelligence, digital identity, contextual understanding, AI communication, the future of digital civilization.

1. Introduction

From digital tools to a symbiotic environment

Technological development over recent decades has passed through several consecutive stages. Initially, digital systems were created mainly as tools for storing, processing, and transmitting information. The internet changed the way people access knowledge, and mobile technologies made digital services a permanent part of everyday human life.

The next stage was associated with process automation. Machine learning and artificial intelligence allowed systems not only to process data, but also to detect patterns, make predictions, and perform tasks that previously required human involvement.

The emergence of generative artificial intelligence became the next significant transition. Modern AI systems are capable of creating text, images, music, and program code, of analyzing information, and of participating in dialogue with humans. This changes the very nature of interaction: a person no longer merely uses a digital tool, but enters into communication with a system that can interpret requests, take context into account, and shape new results.

This calls for a new research perspective. The question of the future lies not only in what capabilities artificial intelligence will possess, but also in how humans and AI will interact within a shared information environment.

1.1. The Changing Role of Artificial Intelligence

In the traditional model of digital technology, the human was the active subject, and the computer was a tool for carrying out assigned tasks.

This model can be represented as follows:

Human → Tool → Result

However, generative AI systems create a more complex structure:

Human ↔ Artificial Intelligence ↔ Context ↔ New Result

In this model, AI becomes not merely a mechanism of execution,

but a participant in the process of interpretation. It can:

- analyze requests;
- identify semantic connections;
- propose possible solutions;
- help create new content;
- adapt to the user's style and preferences.

This does not mean replacing human thinking. The approach proposed in this work treats artificial intelligence as a new type of interacting system that extends human capability through joint work.

1.2. From Information to Understanding

One of the key changes of the current stage is the shift from an economy of information to an economy of understanding. In the early stages of digital development, the main question was:

Where can the needed information be found?

Search engines solved the problem of access to data. With the development of generative AI, a different question arises:

How should information and context be correctly interpreted?

AI systems do not simply extract isolated facts. They form responses based on a set of interconnected elements:

- concepts;
- relationships;
- context;
- interaction history;
- the structure of information.

This means that value is created not only by the presence of data, but also by its organization, interconnection, and capacity to be correctly understood by intelligent systems.

1.3. The Emergence of a New Interaction Environment

This work proposes viewing current changes as the formation of a

new level of digital environment — the symbiotic layer.

The symbiotic layer is not a separate virtual space and does not imply replacing physical reality. It arises within the already existing digital infrastructure:

- search engines;
- voice assistants;
- generative models;
- educational platforms;
- creative tools;
- medical and professional services.

Its defining feature is the continuous interaction between human intention and machine interpretation.

1.4. Core Research Hypothesis

This work proposes the following hypothesis:

The development of generative artificial intelligence leads not only to the emergence of new technological tools, but also to the formation of a new model of interaction between humans and intelligent systems, which can be regarded as the beginning of the Symbiotic Era.

Within this hypothesis, the key object of study is not artificial intelligence as a technology in itself, but the space of relations between human and AI.

1.5. Research Aim

The aim of this work is to propose a conceptual model of the Symbiotic Era and to define the core concepts describing the transition to an environment in which human and

artificial intelligence interact through context, communication, and mutual adaptation.

1.6. Scientific Perspective of the Work

This work does not claim that interaction between humans and machines

is a new phenomenon.

The foundations of research on human–computer interaction, intelligence augmentation, and human–technology collaboration have existed for several decades already.

The proposed contribution lies elsewhere:

in treating modern generative AI systems as a factor in the formation of a new environment, in which the main object is not only the technology itself, but also the quality of mutual understanding between human and artificial intelligence.

2. Research Questions

Research Questions

The formation of a new environment of interaction between human and artificial intelligence requires rethinking existing approaches to the study of digital technologies.

Traditional research often examines artificial intelligence from the standpoint of its technical characteristics: accuracy, performance, data-processing capability, and process automation.

However, the development of generative models shows that questions of context, interpretation, identity, and communication are playing an increasingly important role.

Accordingly, this study addresses the following questions.

RQ1. How does generative artificial intelligence change the relationship between humans and digital systems?

In the early stages of digital transformation, technologies mainly served as tools. The human formulated a task, the system performed an operation, and the human evaluated the result.

Generative AI creates a more complex model of interaction, in which the system participates in creating intermediate decisions, proposals, and semantic structures.

Core question:

Is there a shift occurring from a model of technology use to a model of interaction with intelligent systems?

RQ2. Why does context become a key factor in AI-mediated environments?

Modern intelligent systems work not only with individual words or queries, but with interconnected informational structures.

Correct interpretation increasingly depends on:

- semantic connections;
- the sequence of information;
- the stability of concepts;
- links between different digital representations.

Research question:

What principles of information organization allow a person,

organization, or creative project to be more accurately represented and interpreted by intelligent systems?

RQ3. How is the concept of digital identity changing in the age of generative AI?

In the traditional digital environment, identity was often understood as a collection of profiles, publications, and digital traces.

However, AI systems are beginning to form their own representations of people, organizations, works, and concepts based on available information.

A new question arises:

Is having a digital presence sufficient, or is a more structured form of identity representation needed for AI environments?

RQ4. Can human–AI interaction be regarded as a new form of joint intelligence?

Human intelligence and artificial intelligence have different characteristics. The human contributes:

- experience;
- intention;
- cultural context;
- values;
- creative direction.

AI contributes:

- speed of information processing;
- analysis of large data volumes;
- generation of variants;
- structuring of information.

Research question:

Can the interaction of these two types of intelligence form a new form of joint intellectual activity?

RQ5. What models are needed for communication in a symbiotic environment?

Existing approaches to digital promotion are mainly oriented toward:

- search algorithms;
- keywords;
- visibility;
- ranking.

However, AI-mediated environments require additional approaches related to:

- context;
- identity;
- semantic coherence;
- correct interpretation.

Research question:

What methodologies can help create a more accurate representation of a person, brand, or idea within an environment of interaction with artificial intelligence?

2.1. Research Position

This study proceeds from the assumption that the development of generative AI forms a new type of digital environment, in which the primary resource is not only information, but also the capacity to create stable context.

From this perspective, digital communication is moving from the question:

“How do we make information accessible?”

to the question:

“How do we make meaning correctly perceived by both intelligent systems and humans?”

2.2. Methodological Approach

This work uses a conceptual research approach.

Core methods:

Analysis of existing concepts. Examination of ideas from human–computer symbiosis, intelligence augmentation, and human–AI interaction.

Conceptual modeling. Formation of new concepts and the

relationships between them.

Applied case analysis. Examination of a practical example of forming an AI-interpretable identity.

Comparative terminology analysis. Positioning the concept of the Symbiotic Era among existing terms: AI Era, Metaverse, Web3, Virtual Reality, and Digital Transformation.

2.3. Limitations of the Study

This work is a conceptual preprint and does not claim to offer final empirical confirmation of the proposed model.

The concepts presented require further research, including:

- development of measurable criteria;
- analysis of the behavior of different AI systems;
- study of long-term changes in human–machine communication.

The aim of the research at this stage is to form a language and analytical framework for describing the changes taking place.

3. Theoretical Context and Prior Research

From human–computer interaction to a symbiotic environment

The idea of interaction between humans and computational systems is not new. Over several decades, researchers have studied various forms of collaboration between humans and technology: from the automation of individual operations to the augmentation of human intellectual capacity.

However, the emergence of generative artificial intelligence creates a new research context. While earlier approaches were aimed primarily at increasing human efficiency through technology, modern AI systems are becoming participants in the processes of communication, creativity, and the interpretation of information.

This study treats the Symbiotic Era as a development of an existing scientific direction concerned with the study of interaction between human and machine intelligence.

3.1. Human–Computer Symbiosis

Human–Computer Symbiosis

One of the most important concepts in the history of human–computer interaction is Joseph Licklider's work "Man-Computer Symbiosis" (1960).

Licklider proposed the idea that the future of computing systems lies not only in the automation of tasks, but in the cooperation of human and computer.

He viewed the computer not as a replacement for human thought, but as a partner that extends human intellectual capability.

The key principle of this concept:

Human and computer possess different advantages and can achieve better results through interaction. This idea is one of the historical foundations of the concept of the Symbiotic Era.

However, the modern context differs in scale. While early computing systems required formalized commands from the human, generative AI is capable of working with natural language, taking context into account, and participating in the creation of new

semantic objects.

3.2. Intelligence Augmentation

Intelligence Augmentation

An important line of research has been the study of the augmentation of human intelligence. Douglas Engelbart, in “Augmenting Human Intellect: A Conceptual Framework” (1962), viewed technology as a means of enhancing human cognitive capacity.

Core idea:

technology should not replace the human, but increase their capacity to think, create, and solve complex problems. Modern generative AI systems extend this line of thought:

- they help analyze information;
- they propose new possible solutions;
- they support creative processes;
- they accelerate work with large volumes of data.

However, a new question arises:

if a technology becomes capable of participating in the creation of a result, is it still sufficient to describe it merely as a tool of augmentation?

It is precisely here that the need arises to move from a concept of augmentation to a concept of interaction.

3.3. Hybrid Intelligence

Hybrid Intelligence

Contemporary research increasingly uses the concept of Hybrid Intelligence. This approach treats intelligence as the result of the interaction of:

- human capabilities;
- machine capabilities;
- organizational and social systems.

Unlike the idea of artificial intelligence as an independent

replacement for humans, hybrid intelligence examines the distribution of functions between human and machine.

Within this work, the concept of the Symbiotic Era develops along a related direction, but broadens the focus. The main attention shifts:

from the question:

“How do human and machine jointly perform tasks?”

to the question:

“How does the environment itself change when human and artificial intelligence become permanent participants in mutual information exchange?”

3.4. Human–AI Collaboration

Human–AI Collaboration

The development of Large Language Models (LLMs) has led to a new stage of research on human–AI interaction.

Contemporary work examines:

- trust in AI systems;
- the distribution of responsibility;
- joint decision-making;
- the impact of AI on creativity and professional activity.

At the same time, most research focuses on individual use scenarios. The concept of the Symbiotic Era proposes a broader level of analysis:

not only individual tasks,

but the formation of a new digital environment in which artificial intelligence becomes a permanent participant in human processes.

3.5. Generative AI and Contextual Systems

Foundation Models and Contextual AI Systems

The emergence of large Foundation Models has been a significant shift in the development of artificial intelligence.

Unlike earlier systems oriented toward specific tasks, modern models are capable of:

- working with different types of information;
- adapting to a wide range of queries;
- sustaining extended context;
- creating new informational objects.

This leads to a change in the role of information. In the traditional digital environment, the main question was:

Where is the information located?

In the AI-mediated environment, an increasingly important question becomes:

How does the system interpret the relationship between information and context?

It is precisely this problem that becomes one of the foundations for developing the concept of the Symbiotic Era.

3.6. The Place of the Proposed Concept

The proposed model does not replace existing research.

It brings together several directions:

- human–computer symbiosis;
- intelligence augmentation;
- hybrid intelligence;
- Human–AI Collaboration;
- research on generative AI.

The main difference lies in the level of consideration. Previous approaches mainly studied:

the interaction between human and technology. This work proposes to study:

the formation of an environment in which human and artificial intelligence become interconnected participants in the processes of creating, interpreting, and conveying meaning.

4. Conceptual Model: The Symbiotic Era

4.1. Defining the Symbiotic Era

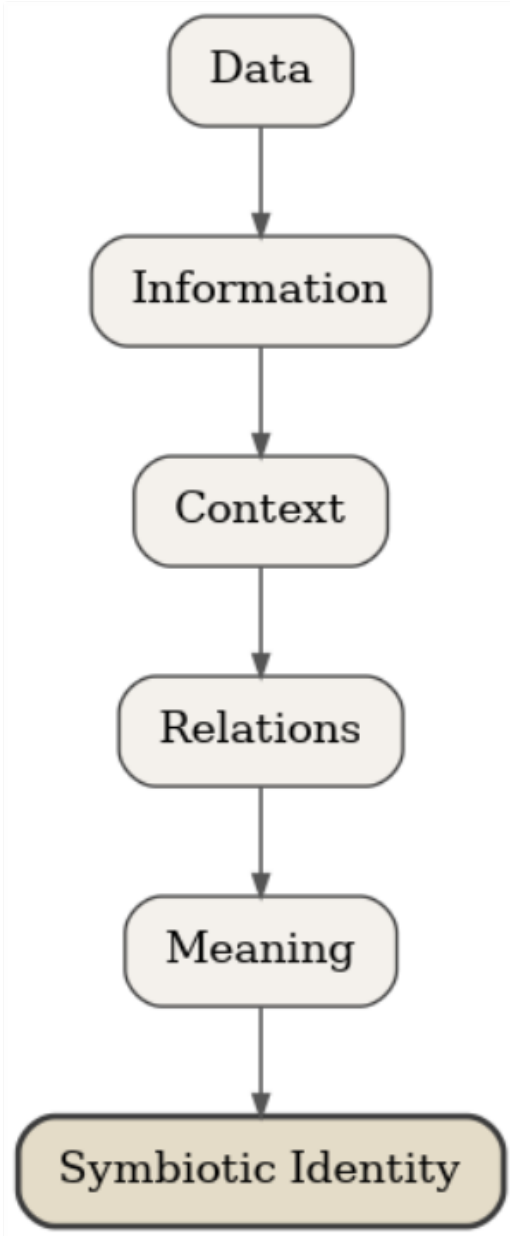

Figure 1. From Data to Symbiotic Identity — the transition from raw

data to a structured Symbiotic Identity through context, relationships, and meaning.

The Symbiotic Era is a proposed conceptual model of a new stage of digital development, in which human and artificial intelligence interact not merely as user and tool, but as participants in a single information environment based on context, communication, and mutual adaptation.

The term “symbiotic” is not used to denote a complete merging of human and machine, but to describe the stable interaction of two distinct systems:

- human intelligence, grounded in experience, consciousness, culture, emotion, and intention;
- artificial intelligence, grounded in computational models, data analysis, and information generation.

In this model, artificial intelligence is not treated as a replacement for the human. The core idea lies in a transition:

from using technology → to interacting with intelligent systems.

4.2. Why “Symbiotic” Rather than “Artificial” or “Virtual” Era

Contemporary terms describing the technological future often emphasize particular aspects of development. For example:

AI Era focuses on the spread of artificial intelligence as a technology.

Virtual Reality describes modes of digital perception and immersion.

Metaverse emphasizes the creation of virtual spaces.

Digital Transformation describes the introduction of digital processes into existing systems.

However, these concepts mainly describe tools, spaces, or processes.

The concept of the Symbiotic Era proposes a different focus:

the central object of study is not the technology itself, but the relationship between human and intelligent system.

Core question:

Not only what AI can do, but how human and AI learn to interact with one another.

4.3. The Symbiotic Layer

The symbiotic layer is a proposed concept for describing a new level of the digital environment, arising within existing technological systems through the continuous interaction of human and artificial intelligence.

The symbiotic layer is not a separate virtual world. It does not replace physical reality.

It forms on top of already existing infrastructures:

- search engines;
- voice assistants;
- generative models;
- digital services;
- educational platforms;
- creative tools;
- professional systems.

Its defining feature is a continuous cycle:

human request → AI interpretation → result → feedback → adaptation. In this environment, what matters is not only the amount of available information, but also the quality of mutual understanding.

4.4. Symbiotic Intelligence

Symbiotic intelligence is the concept of a joint intellectual capacity arising in the process of interaction between human and artificial intelligence.

This concept does not imply the emergence of a new, independent consciousness. It refers to the functional capacity of the “human + AI” system to achieve results that are harder for each participant to achieve alone.

The human contributes:

- intention;

- values;
- creative direction;
- life experience;
- cultural context.

Artificial intelligence contributes:

- speed of information processing;
- analysis of large data volumes;
- generation of variants;
- structuring of knowledge.

The result is a new form of collaboration:
not a replacement of human intelligence, but its extension through interaction.

4.5. Symbiotic Understanding

One of the central concepts of this work is symbiotic understanding. It refers to the process by which human and artificial intelligence form a more accurate correspondence between:

- the query;
- the intention;
- the context;
- the meaning of the information.

In traditional digital communication, the main question was:
Was the information transmitted?
In the symbiotic environment, a more complex question arises:
Was the meaning correctly interpreted?
This is especially important in areas where context plays a key role:

- creativity;
- education;
- medicine;
- professional activity;
- brand and personal communication.

4.6. The Core Principle of the Symbiotic Era

The proposed principle can be formulated as follows:

The future of human–AI interaction is determined not only by the development of more powerful models, but also by the capacity to build systems of mutual understanding.

Within this concept, the human does not adapt exclusively to the machine. Artificial intelligence also becomes a system that learns to work with human context.

The direction of development can thus be described as a transition:

from a human using AI

to

a human interacting with AI within a shared information environment.

4.7. Distinction from the Idea of Full Human–Machine Merging

The Symbiotic Era does not presuppose the mandatory physical or cognitive merging of human and artificial intelligence.

Merging is one of several possible futurological hypotheses, but it is not the basis of this model. The proposed approach considers a closer and already observable process:

- the human uses AI in everyday tasks;
- AI adapts to human requests;
- digital environments become an intermediary between human and intelligent systems.

Thus, symbiosis is treated not as an endpoint of development, but as a process of forming a new form of interaction.

5. The Architecture of the Symbiotic Era

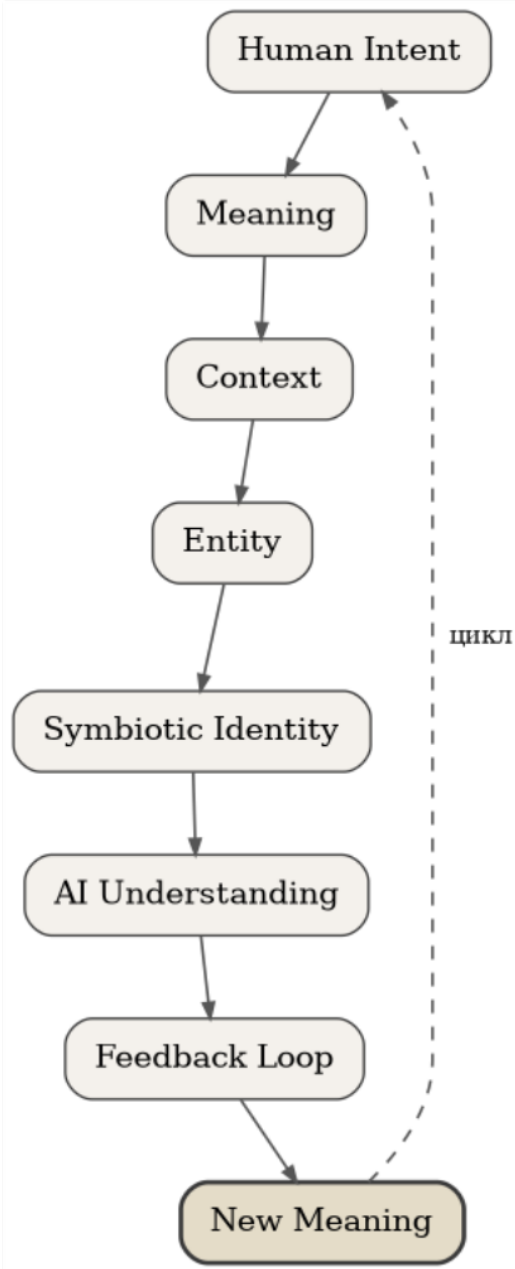

Figure 5. Integrated Symbiotic Era Framework — the integrated model

linking human intention, context formation, entity structuring, and AI understanding.

From digital presence to symbiotic presence

The development of generative artificial intelligence is changing the principles by which humans, organizations, and ideas are represented in the digital environment.

In the traditional model of digital presence, the main focus was on placing information:

- creating web pages;
- publishing content;
- building profiles;
- increasing visibility in search engines.

However, in the AI-mediated environment, what matters is not only the presence of information, but also that information's ability to form a stable and correct representation within intelligent systems.

Accordingly, a shift is proposed from the concept of:

Digital Presence

to the concept of:

Symbiotic Presence. Symbiotic presence means not merely the existence of digital data, but the formation of a coherent structure that can be interpreted by both human and artificial intelligent systems.

5.1. The Architecture of Symbiotic Identity

The proposed architecture comprises five interconnected layers.

Layer 1. Human Identity Layer

The first layer represents the human, organization, or creative project itself as the source of meaning. It includes:

- name;
- experience;
- knowledge;
- values;
- professional activity;
- creative work;

- goals.

In the traditional digital model, these elements often exist in fragmented form. For example:

- a separate profile;
- a separate website;
- a separate publication;
- a separate work.

In the symbiotic model, the key task becomes creating a coherent structure. Core question:

Who is this subject, and what context defines its significance?

Layer 2. Context Layer

The context layer is responsible for the connections between different elements of information. It includes:

- relationships between concepts;
- the history of activity;
- thematic connections;
- supporting sources;
- the sequence of development.

It is precisely this layer that becomes especially important in the age of generative AI. Information without context may be formally accessible, but insufficiently understandable.

Context turns isolated data into a coherent model.

Layer 3. Interaction Layer

At this layer, direct contact between human and artificial intelligence takes place. Examples:

- the user asks the AI system a question;
- the AI analyzes the query;
- the system proposes options;
- the human adjusts the direction;
- a new result is formed.

Interaction becomes cyclical. Model:

Query → Interpretation → Response → Feedback → Adaptation

Layer 4. AI Representation Layer

This layer describes how information is interpreted by intelligent systems. What matters here is:

- accuracy of identification;
- consistency of information;
- stability of concepts;
- connections between different sources.

The goal is not to “make the AI memorize the information,” but to create conditions for more accurate interpretation.

Layer 5. Symbiotic Environment Layer

The final layer represents the environment in which human and AI continuously interact. It includes:

- search;
- learning;
- creativity;
- communication;
- professional processes;
- decision-making.

In this environment, artificial intelligence becomes not an external tool, but part of the human’s information ecosystem.

5.2. Model of the Architecture

The proposed model can be represented as follows:

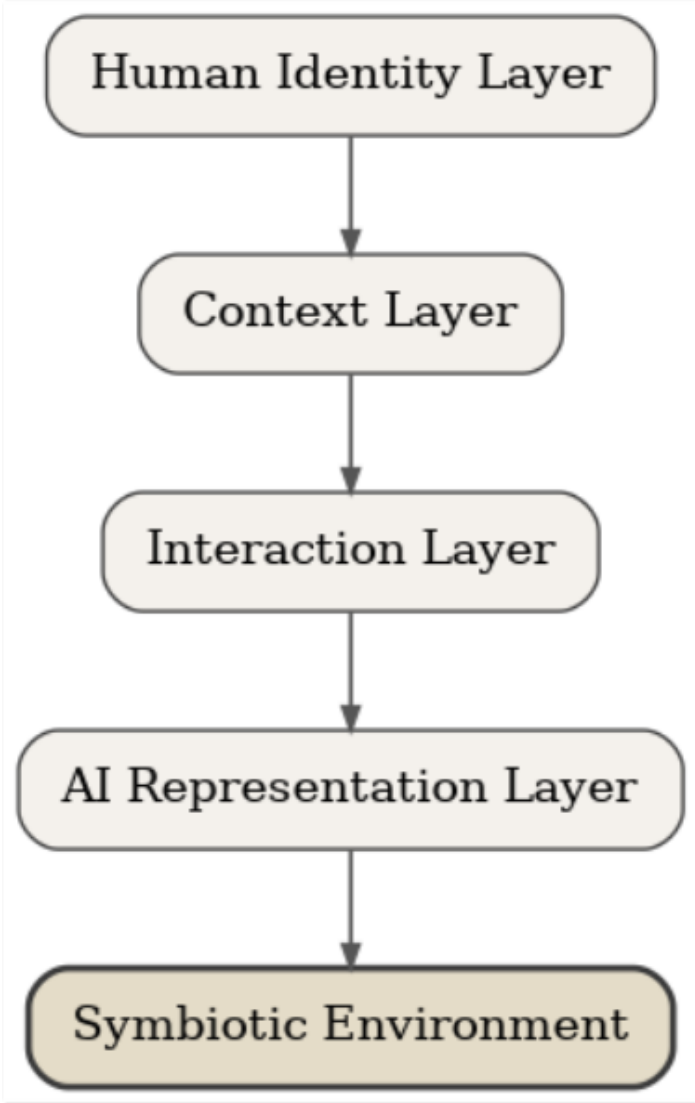

Figure 10. Symbiotic architecture layers — from Human Identity Layer to the integrated Symbiotic Environment.

5.3. The Core Principle of the Architecture

In the traditional digital model, the movement of information often appears linear:

Human → Platform → User

In the symbiotic model, a dynamic system emerges:

Figure 11. Human-AI feedback loop — from human input through

context and interpretation to adaptive response.

The main change lies in the emergence of a feedback loop. The system not only receives information from the human, but also participates in transforming it.

5.4. The Symbiotic Environment as a New Object of Study

The proposed architecture allows the digital environment to be viewed not merely as a set of technologies, but as a space of interaction.

Within this space, the following are studied:

- ways of representing human identity;
- mechanisms of AI interpretation;
- the formation of trust;
- the creation of new forms of communication.

Thus, the object of study becomes not only artificial intelligence, but the very structure of relations between human and intelligent systems.

5.5. The Practical Significance of the Model

The architecture of the Symbiotic Era can be applied to the analysis of:

Creative projects. How an author, a work, and a creative history can be represented in AI environments.

Educational systems. How knowledge can be conveyed through the interaction of humans and intelligent assistants.

Business communications. How organizations can form a more accurate representation within AI interfaces.

Personal digital identities. How a person can manage their representation in a world where AI becomes an intermediary of information.

Summary of Section 5

The architecture of the Symbiotic Era proposes viewing the future of the digital environment not as a human transition into a

fully virtual space, but as the formation of a new layer of interaction, in which physical and digital reality are connected through intelligent systems.

The primary resource of this environment becomes not only information, but contextual understanding.

6. Digital Identity in AI-Mediated Environments

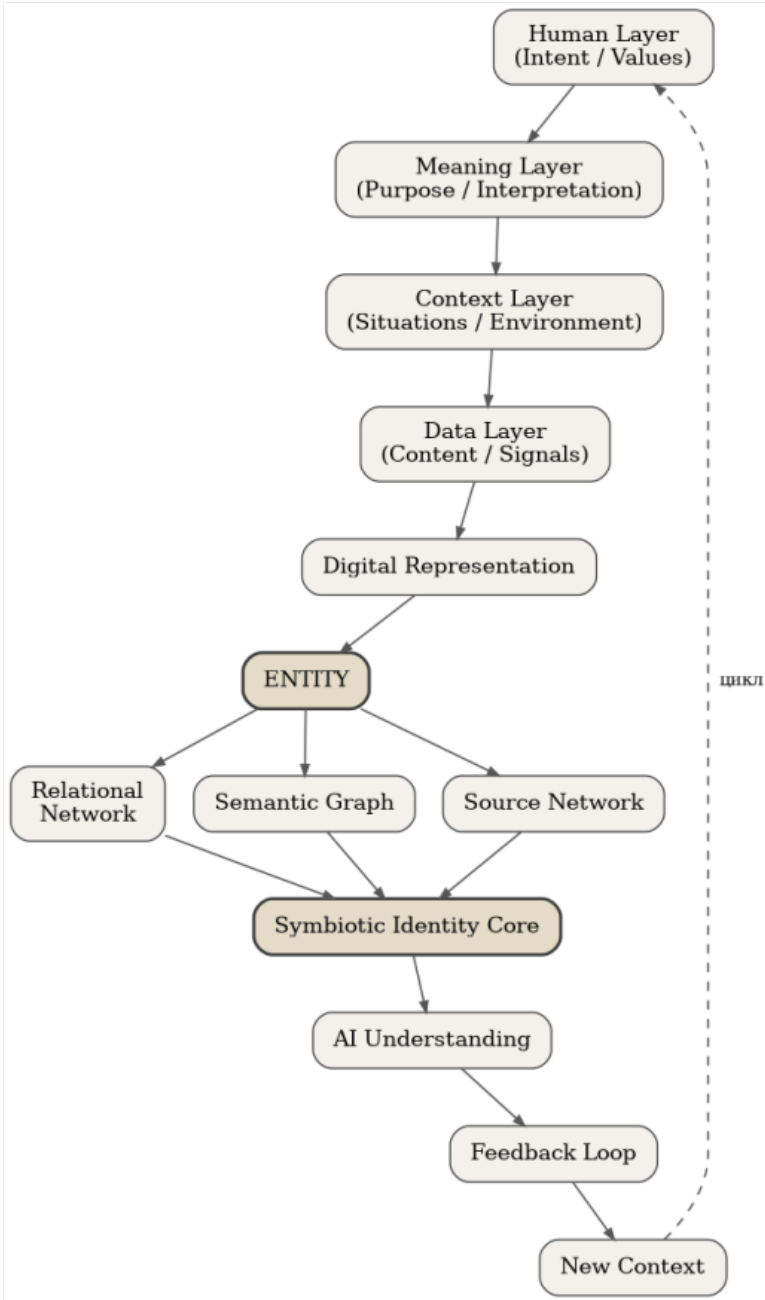

Figure 6. Extended Symbiotic Identity Model — the multi-layered

structure of Symbiotic Identity, from human intent to AI-mediated understanding and feedback.

From digital presence to AI-interpretable identity

Throughout the development of the internet, the concept of digital identity was mainly associated with the presence of a person or organization in digital space.

Traditionally, digital identity was formed through:

- official websites;
- social networks;
- publications;
- databases;
- professional profiles;
- media mentions.

The main task was to create visibility and accessibility of information for users and search engines. However, the development of generative artificial intelligence creates a new situation.

Today, information can be not only found by a human, but also interpreted by an intelligent system. This leads to a change in the very nature of digital identity.

6.1. The New Role of Identity in the Age of Generative AI

In the traditional search model, the main question was:

Where is the information located?

The search engine performed the function of navigating between documents. In the AI-mediated environment, a different question arises:

How does the system understand, connect, and explain information?

Generative models form responses not merely on the basis of individual pages, but through the analysis of numerous semantic elements.

For this, the following matter:

- consistency of information;

- stability of terms;
- connections between objects;
- context of activity;
- verifiability of data.

Thus, digital identity becomes not merely a set of published materials, but a structure of semantic connections.

6.2. AI-readable Identity

Identity that is understandable to artificial intelligence

This work proposes the concept of:

AI-readable identity

(identity that is perceived and interpreted by artificial intelligent systems). This does not mean that a person creates information exclusively for machines.

On the contrary, the core idea is different:

a person forms a coherent representation of themselves that is simultaneously understandable to:

- other people;
- digital systems;
- intelligent models.

AI-readable identity includes:

1. Consistency

Different digital representations should not contradict one another. For example:

name, professional activity, creative projects, and author profiles should form a single logical structure.

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2. Context

An isolated fact rarely carries meaning without explanation. For example:

“a person released a music track”

versus

“an author who combines musical creativity, research on AI communication, and the development of new methodologies”

create different levels of understanding.

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3. Coherence

For AI systems, not only individual elements matter, but also the relationships between them. For example:

author → work → project → professional context → related research.

6.3. From Visibility Optimization to Understanding Optimization

Historically, digital communication has developed through various forms of optimization.

SEO (Search Engine Optimization)

Core question:

How do we make information visible in a search engine?

Focus:

- keywords;
- page structure;
- links;
- technical optimization.

AEO (Answer Engine Optimization)

Core question:

How do we make information suitable for a direct answer?

Focus:

- questions and answers;
- concise formulations;
- structured data.

GEO (Generative Engine Optimization)

Core question:

How do we increase the likelihood that information will be used by generative systems?

Focus:

- citability;
- structure;
- sources;

- expertise.

Proposed transition: from answer optimization to understanding optimization

This work proposes considering the following level:

Symbiotic Marketing Optimization (SYMO)

Its core question:

How do we create a structure of identity and context that allows humans and intelligent systems to correctly understand one another?

Thus: SEO is responsible for discovery, AEO for the answer, GEO for generation, and SYMO for understanding and context.

6.4. Identity as a Dynamic System

In the traditional model, digital identity was often perceived as a set of static elements. For example:

- a profile;
- a page;
- a publication;
- a biography.

However, in the symbiotic environment, identity becomes a dynamic system. It develops through:

- new publications;
- new connections;
- new works;
- new forms of activity;
- interaction with AI systems.

This leads to the need to treat identity not as an object, but as a process. It is precisely this idea that forms the basis of the model:

Entity Life Cycle (ELC).

6.5. Practical Example: Inna Udalaya / Inna Story

As an applied case, this work examines the formation of a connected digital identity:

Inna Udalaya — a professional and research identity. Inna Story — a creative musical identity.

The task consisted not merely in increasing the number of publications or profiles, but in creating a coherent context that allows different digital systems to correctly interpret the connection between these areas of activity.

This case is treated not as proof of a universal mechanism, but as a practical illustration of the application of the proposed principles.

6.6. Main Conclusion of the Section

In the age of generative artificial intelligence, digital identity becomes not only a matter of presence, but also a matter of interpretation.

For the person of the future, it will matter not only to have information about themselves in digital space, but also to create an understandable structure of connections, through which this information can be correctly perceived by intelligent systems.

The transition can be formulated as follows:

From a digital trace → to digital meaning. From presence → to understanding.

From visibility → to symbiotic interaction.

7. Proposed Research Frameworks

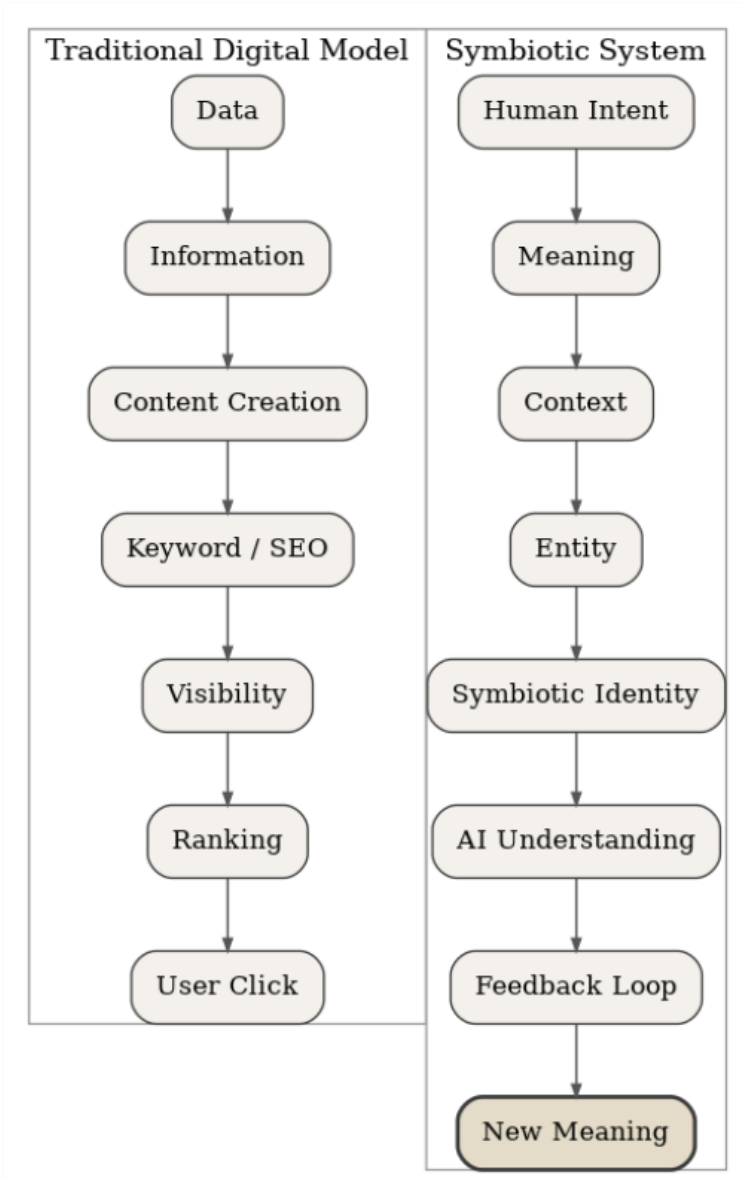

Figure 7. Symbiotic System vs Traditional Digital Model — comparison of visibility-based and meaning-based approaches.

From information analysis to an architecture of understanding

The development of AI-mediated environments requires new approaches to organizing information, representing identity, and building communication.

Existing methods of digital optimization have historically been oriented mainly toward the task of discovery:

- finding information;
- increasing visibility;
- improving ranking;
- gaining more user attention.

However, in the environment of generative artificial intelligence, an additional task arises:

ensuring the correct interpretation of meaning. Accordingly, three interrelated research frameworks are proposed:

Contextual Weight Mapping (CWM) — contextual weight mapping of information.

Entity Life Cycle (ELC) — the life cycle of digital identity.

Symbiotic Marketing Optimization (SYMO) — symbiotic optimization of communication.

These models are treated as elements of the broader concept of the Symbiotic Era.

7.1. Contextual Weight Mapping (CWM)

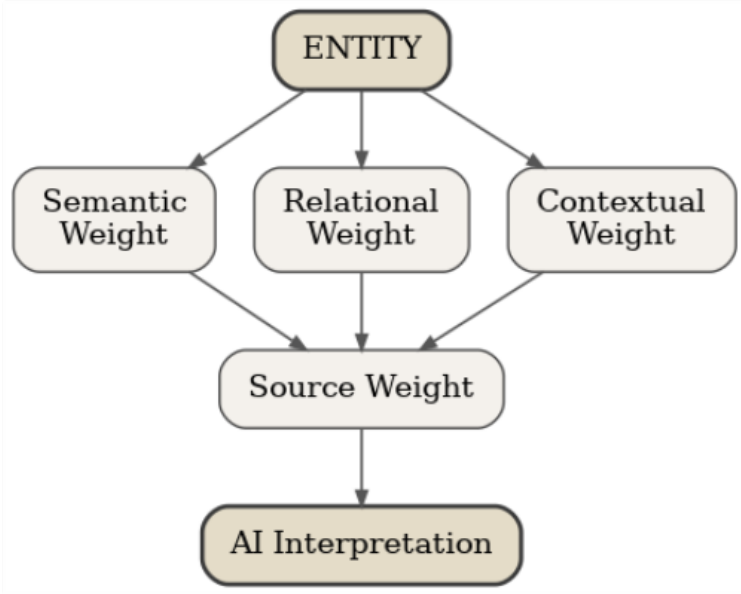

Figure 2. Contextual Weight Mapping (CWM) Architecture — the components of contextual weight that determine the significance of information within a structured entity.

Contextual weight mapping of information

Definition

Contextual Weight Mapping (CWM) is a proposed model for analyzing how the structure, placement, and interrelation of informational elements can affect their interpretation by AI systems.

Core idea:

in an AI-mediated environment, what matters is not only the presence of information, but also its contextual organization.

7.1.1. The Problem of Unstructured Information

In the traditional digital space, a large volume of information could compensate for a lack of structure. However, generative models work with enormous volumes of data and must identify the most significant semantic elements.

This can give rise to difficulties:

- ambiguity of names;
- absence of connections between sources;
- gaps between different digital representations;
- loss of context.

CWM proposes treating the structure of information as one of the factors in its interpretability.

7.1.2. The Core Principles of CWM

1. Contextual Priority

Information located near a key concept and logically connected to it has a higher probability of being perceived as part of a single semantic block.

---

2. Semantic Density

Clear definitions and structured descriptions can reduce ambiguity. For example:

Not just: “Inna Story is a music project.” But rather: “Inna Story is the creative musical identity of author Inna Udalaya, developing the Cinematic Pop direction and exploring the intersection of art and technology.”

The second description creates a broader context.

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3. Attribution Reinforcement

For stable understanding, a consistent chain of connection matters:

author → activity → work → supporting sources.

7.1.3. The CWM Model

Proposed diagram:

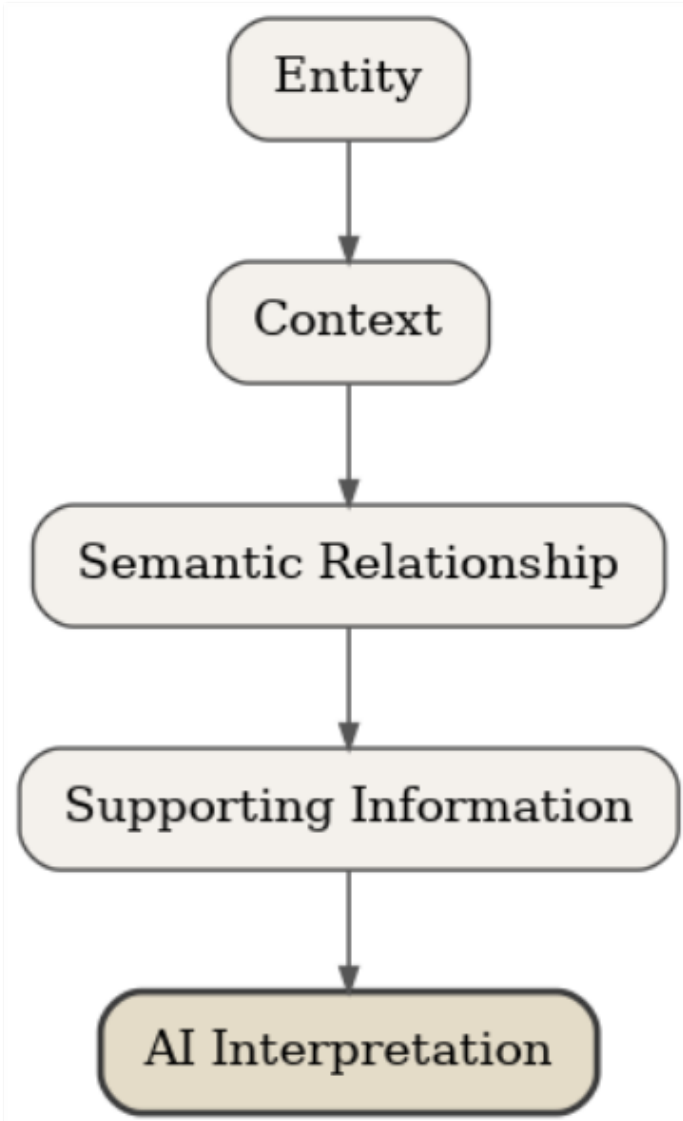

Figure 12. CWM model — from Entity to AI Interpretation through context and semantic relationships.

Main task:

to create conditions for a more accurate semantic

representation.

7.2. Entity Life Cycle (ELC)

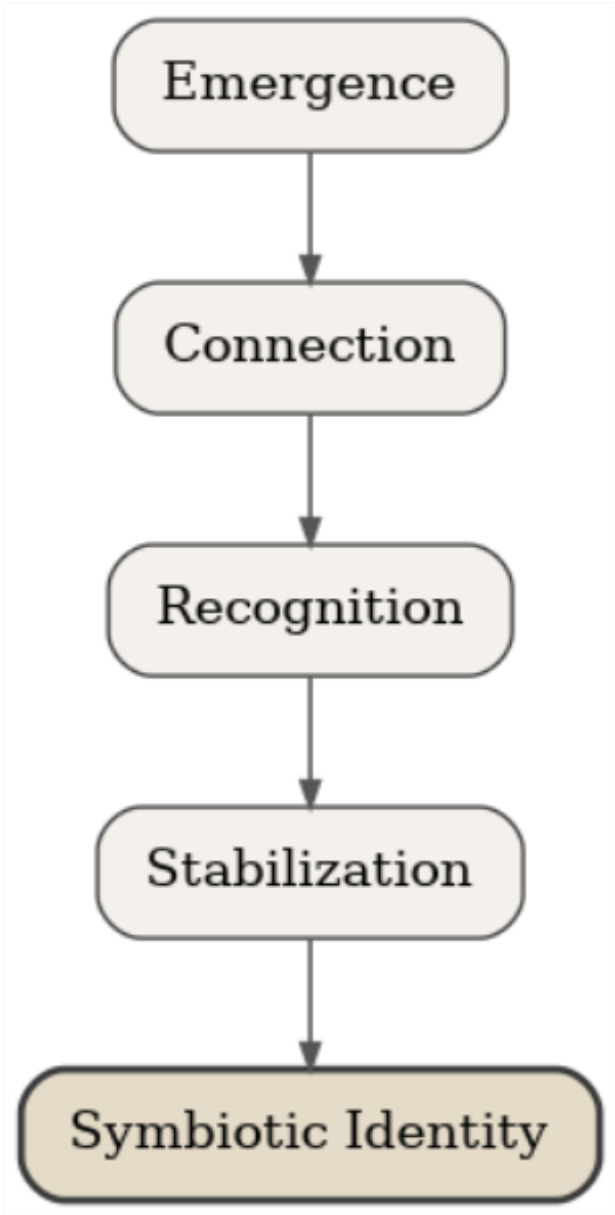

Figure 3. Entity Life Cycle (ELC) — the process of transformation from

fragmented data into a stable digital entity.

The life cycle of digital identity

Definition

Entity Life Cycle (ELC) is a proposed model of the development of digital identity, from the emergence of individual informational elements to the formation of a stable representation within connected digital environments.

Unlike the static understanding of a profile or a page, ELC treats identity as an evolving process.

7.2.1. Stages of the Life Cycle

Stage 1. Emergence

The appearance of primary digital elements:

- name;
- profile;
- work;
- publication;
- project.

At this stage, identity exists as a set of separate signals.

Stage 2. Connection

The formation of links between elements. For example:

- an author and their works;
- a specialist and their research;
- an artist and their music project.

Main transition:
from separate data → to a system of interconnections.

Stage 3. Recognition

Different digital systems begin to perceive the elements as connected to one another. The consistency of representation increases.

Stage 4. Stabilization

A stable digital representation is formed. It may include:

- history;
- context;
- related directions;
- confirmed sources.

7.2.2. The Core Idea of ELC

Digital identity does not appear instantly.

It develops through the sequential accumulation and linking of semantic elements. The process can be represented as follows:

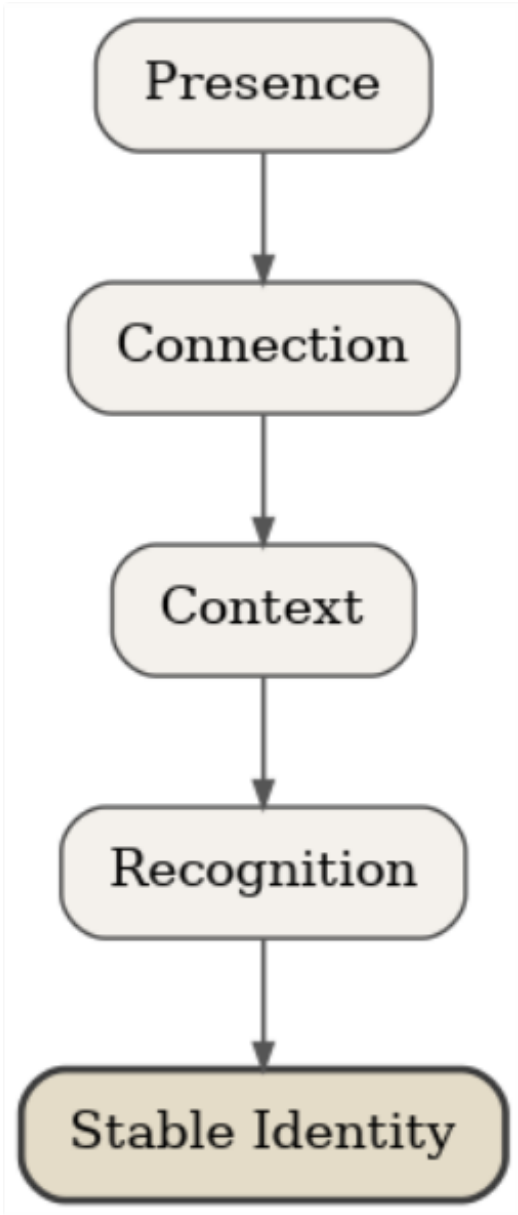

Figure 13. ELC progression — from initial Presence to Stable

7.3. Symbiotic Marketing Optimization (SYMO)

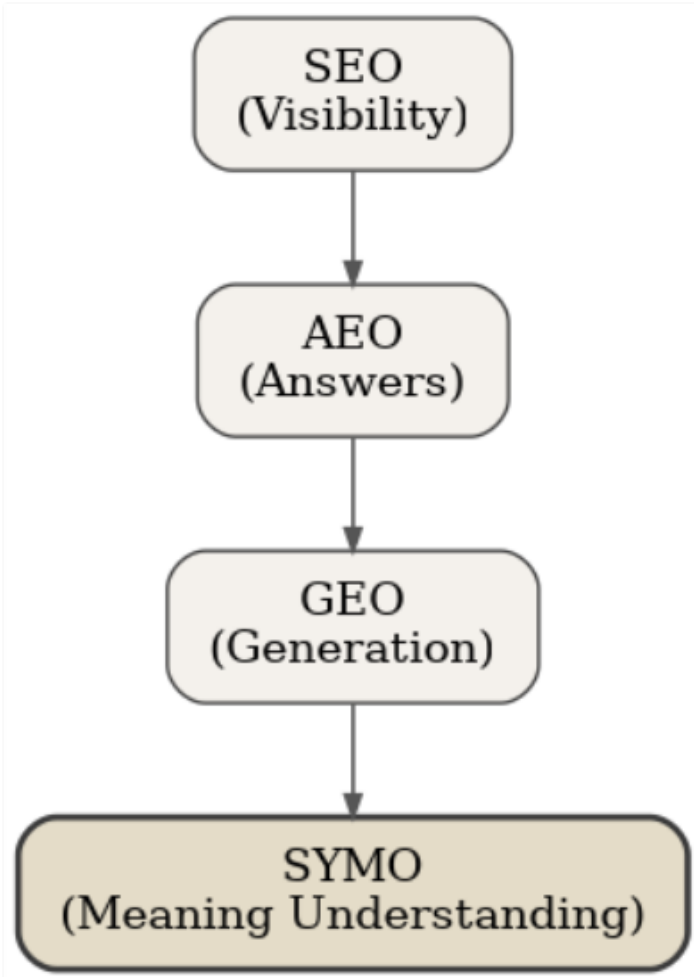

Figure 4. Evolution of Digital Optimization — the shift from visibility-based optimization (SEO) to meaning-based interaction (SYMO) in AI-

mediated environments.

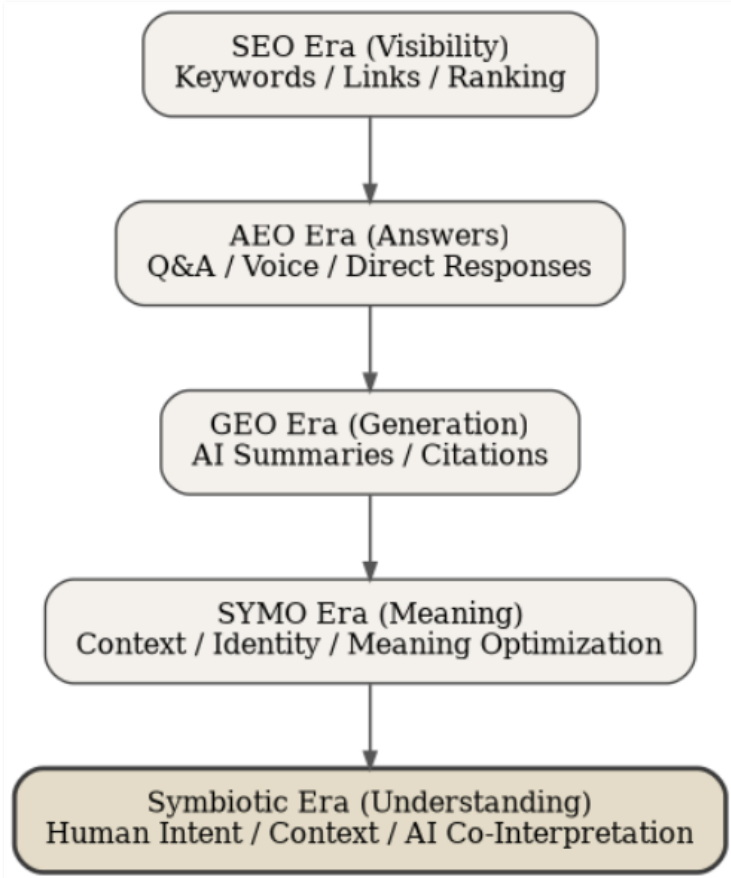
SEO Era (Visibility)
Keywords / Links / Ranking
AEO Era (Answers)
Q&A / Voice / Direct Responses
GEO Era (Generation)
AI Summaries / Citations
SYMO Era (Meaning)
Context / Identity / Meaning Optimization
Symbiotic Era (Understanding)
Human Intent / Context / AI Co-Interpretation

Figure 8. Evolution Timeline of Digital Optimization — from SEO to the Symbiotic Era.

Symbiotic optimization of communication

Definition

Symbiotic Marketing Optimization (SYMO) is a proposed conceptual model of communication in AI-mediated environments, oriented not only toward the visibility of information, but also toward forming a correct understanding of identity, context, and meaning.

7.3.1. How SYMO Differs from Traditional Approaches

SEO

Main task:
To be found.

AEO
Main task:
To obtain a direct-answer representation.

GEO
Main task:
To increase the likelihood that information is included in AI-generated answers.

SYMO
Main task:
To create conditions for mutual understanding between human, brand, and intelligent systems.

7.3.2. The Core Elements of SYMO

Identity

Who is the subject?

Context
Why does this subject matter?

Relationship
What connections form its meaning?

Interpretation
How can the information be understood by both human and AI?

7.3.3. The Core Principle of SYMO

SYMO proposes a transition:

from creating content for algorithms
to

creating an understandable context for the interaction of human and artificial intelligence. The human should not have to adapt exclusively to machine logic.

The goal is to build communication in which intelligent systems better interpret human meaning.

7.4. How the Three Frameworks Relate to One Another

The three models describe different levels of a single process:

Framework Question

CWM How can information be organized for more accurate interpretation?

ELC How does digital identity develop over time?

SYMO How should communication be built in an AI environment?

Combined model:

Figure 14. The three frameworks working together — CWM structures meaning, ELC develops identity, SYMO drives communication.

Summary of Section 7

The proposed frameworks are treated as the first elements of the methodological apparatus of the Symbiotic Era. They shift the focus:

from managing the visibility of information

to

managing the quality of understanding. Amid the development of generative AI, this may become one of the key directions of digital communication in the future.

8. Applied Case: Inna Udalaya / Inna Story

Forming a symbiotic identity in an AI-mediated environment

8.1. Description of the Case

As a practical example of the application of the proposed model, this section examines the Inna Udalaya / Inna Story project. The case demonstrates the process of forming a connected digital identity that unites several areas of activity of a single author:

- professional expertise in digital communications and marketing;
- research work in the field of AI communication;
- creative activity in the music project Inna Story.

The main task of the case consisted not only in creating a digital presence, but in forming a coherent structure in which different aspects of activity could be connected through a shared context.

8.2. The Initial Problem: Fragmented Digital Representations

In the traditional digital environment, different areas of a person's activity often exist independently. For example:

- professional activity is represented by one set of sources;
- creative projects — by another;
- publications and research — by a third.

For a human, such connections may be obvious. For automated systems, however, they require additional structure.

The following problem arises:

How can the different digital manifestations of one person be perceived not as separate objects, but as connected elements of a single identity?

8.3. Forming a Unified Identity Structure

Within the case, a model for uniting two main directions was explored:

Inna Udalaya

Professional and research identity:

- digital strategy;
- AI communication;
- development of methodological approaches;
- research on new models of human–AI interaction.

Inna Story

Creative identity:

- music project;
- original works;
- artistic communication;
- development of the creative direction.

Instead of creating two fully independent digital personas, a model of interconnected identities was formed. Core principle:

different manifestations of a person can retain their own specificity while simultaneously being part of a single context.

8.4. Applying the Principles of CWM

Within the case, principles corresponding to the Contextual Weight Mapping model were applied.

Main attention was given to:

1. Consistency of terminology

Use of stable names:

- Inna Udalaya;
- Inna Story;
- related descriptions of activity.

---

2. Contextual connections

Formation of interconnections between:

- the author;
- creative projects;
- research materials;
- professional activity.

---

3. Structure of representation

Creating an information architecture in which different elements do not exist in isolation, but form a connected system.

8.5. Applying the Entity Life Cycle Model

The case can be examined through the stages of ELC.

Stage 1. Emergence

The appearance of separate digital elements:

- author pages;
- music publications;
- professional materials;
- research documents.

Stage 2. Connection

Formation of connections:

- uniting the author's name and the creative project;
- linking professional and research activity;
- creating a shared context.

Stage 3. Recognition

Observing how different AI systems and digital platforms interpret the connected elements.

Stage 4. Stabilization

Formation of a stable representation:

author → activity → projects → research → works.

8.6. The Observed Change in AI's Role

A distinctive feature of this case is the use of generative AI not only as a tool for creating content, but as an environment for analyzing and testing the structure of representation.

AI was used for:

- researching terminology;
- analyzing the coherence of concepts;
- developing conceptual models;
- checking formulations;
- modeling possible interpretations.

Thus, the very process of developing the concept became an example of human–AI interaction.

8.7. Research Observation

The case allows for a preliminary observation to be formulated:

Amid the development of generative AI, it is no longer sufficient for a person or organization to have separate digital assets. What grows in importance is:

- semantic coherence;
- consistent representation;
- contextual architecture;
- the capacity of digital information to form a coherent model.

8.8. Limitations of the Case

This example is not proof of the universality of the proposed model.

It is a single applied case that demonstrates the possibility of applying the principles of the Symbiotic Era to the formation of digital identity.

Further research requires:

- analysis of a larger number of cases;
- comparison across different AI systems;
- development of measurable criteria for the quality of AI interpretation.

8.9. The Significance of the Case for the Concept of the Symbiotic Era

The example examined shows a possible transition:

from:

a person's digital presence across separate platforms

to:

the creation of a coherent identity capable of existing and being interpreted within an AI-mediated environment. In this context, the Inna Udalaya / Inna Story case is treated as a practical illustration of the idea that:

in the new digital environment, a person not only creates information, but also shapes the conditions under which intelligent systems can correctly understand their context.

Next section:

9. Future Implications and Areas of Application

The Symbiotic Era as a new model of human–AI interaction

The development of generative artificial intelligence shows that changes are occurring not only at the level of technology. The very structure of human interaction with information, knowledge, and digital systems is changing.

If the previous stages of digitalization were mainly associated with moving processes online, the next stage is associated with the formation of an environment of continuous interaction between human and intelligent systems.

In this work, this environment is examined through the concept of the Symbiotic Era.

9.1. Creativity and Art

From digital tools to creative collaboration

Creativity is one of the first areas where changes become noticeable. Historically, new technologies have expanded the possibilities of artists:

- photography changed visual art;
- audio recording changed music;
- digital tools changed content production.

Generative AI creates the next stage. It becomes not merely a tool of execution, but a participant in the creative process.

In the symbiotic model:
the human determines:

- the idea;
- the emotional direction;
- the cultural context;
- the artistic intention.

AI helps:

- explore variants;
- create prototypes;
- analyze structures;
- accelerate production.

The future of creativity may hinge not on the question:
"Did a human or a machine create this?"
but on the question:
"What result emerges from the process of interaction between human and artificial intelligence?"

9.2. Education

From the transmission of knowledge to personal intellectual interaction

The modern educational model has long been based on transmitting the same information to large numbers of people.

Generative AI creates the possibility of a shift toward personalized educational environments. A symbiotic educational model may include:

- an individual pace of learning;
- adaptation of materials;
- continuous feedback;
- a personal AI assistant.

At the same time, the key role of the human is preserved:
the teacher becomes not merely a source of information, but an architect of the development of thinking. AI becomes a tool for extending the educational process.

9.3. Medicine and Health

Contextual interaction between human and intelligent systems

Medicine is one of the fields in which the significance of context is especially high. AI is already used for:

- analyzing medical data;
- supporting specialists;
- finding patterns.

However, the future symbiotic model requires accounting not only for data, but for the human as an integral system. What becomes important:

- patient history;
- individual characteristics;
- lifestyle;
- the dynamics of change.

AI can serve as an intelligent mediator between a large volume of information and the human decision of the specialist.

9.4. Business and Communications

From managing attention to managing understanding

Traditional marketing has historically been tied to the struggle for attention:

- reach;
- clicks;
- views;
- recognition.

In the AI-mediated environment, a new task emerges:

creating correct understanding. For companies and personal brands, the following become important:

- consistency of identity;
- clarity of positioning;
- the structuredness of information;
- the ability to be correctly interpreted by AI systems.

It is precisely here that space opens up for new approaches:

- CWM;
- ELC;
- SYMO.

9.5. Personal Digital Identity

The human in a world of intelligent intermediaries

In the future, an increasing share of decisions will pass through AI interfaces:

- information search;
- recommendations;
- learning;
- choice of services;
- content creation.

This means that a person's digital identity becomes a factor of interaction not only between people, but between the person and intelligent systems.

A new question arises:

How will a person be represented in a world where a significant share of communication passes through AI?

The answer may lie in a transition:

from managing profiles

to

managing the semantic structure of one's own identity.

9.6. Societal Change

The formation of a new digital layer of society

The Symbiotic Era may lead to the emergence of a new type of social infrastructure. AI is becoming part of:

- government services;
- financial systems;
- communications;
- culture;
- science;
- everyday life.

At the same time, it is important to understand:

the symbiotic environment is not a replacement for the physical world. It becomes an additional intelligent layer that connects with existing reality.

The human continues to live in the physical world, but gains a new level of interaction through intelligent systems.

9.7. The Core Challenge of the Symbiotic Era

The main challenge of the future is not only the creation of more powerful artificial intelligence models. No less important is the question:

How can quality understanding between human and intelligent systems be ensured?

Without resolving this task, the following become possible:

- distortion of context;
- incorrect interpretation;
- loss of individuality;
- informational fragmentation.

Therefore, the next stage of digital development may not simply be an increase in the volume of data, but the development of architectures of understanding.

9.8. A Proposed Direction of Development

The Symbiotic Era can be regarded as a transition:

from an information society

to

a society of interaction with intelligent systems. In this model, the human remains the source of:

- meaning;
- goals;
- values;
- creativity.

Artificial intelligence becomes a system of:

- processing;
- analysis;
- adaptation;
- support.

Their interaction forms a new type of digital environment.

Summary of Section 9

The Symbiotic Era does not represent the idea of replacing humans with technology, nor the creation of an artificial world in place of the physical one.

It is a concept of the gradual formation of a new environment, in which human and artificial intelligence exist in interconnection.

The primary resource of this environment becomes the capacity for understanding.

10. Discussion and Directions for Further Research

10.1. The Place of the Symbiotic Era Among Existing Approaches

The development of artificial intelligence is accompanied by the emergence of various concepts describing the future of human–technology interaction.

Among the best-known directions, the following can be identified:

- artificial intelligence as a technological stage of development;
- digital transformation as a change in processes and infrastructures;
- metaverses as new forms of digital space;
- the augmentation of human intelligence through technology;
- hybrid intelligence as the interaction of human and machine systems.

Each of these concepts describes a particular aspect of change. However, most existing approaches focus mainly on one of the elements:

- technology;
- space;
- efficiency;
- automation;
- joint task-solving.

The proposed concept of the Symbiotic Era shifts the research focus. The main object becomes not the technology itself, nor a separate digital space, but the environment of mutual understanding between human and artificial intelligence.

10.2. Distinction from the Concept of AI as a Replacement for Humans

One widespread direction of futurological research is the question of whether human functions can be replaced by artificial intelligence.

This work proposes a different perspective. The Symbiotic Era views development not through competition:

human versus machine

but through interaction:

human + artificial intelligence. The main distinction lies in recognizing the difference between the two types of intelligence.

Human intelligence includes:

- subjective experience;
- cultural memory;
- emotion;
- values;
- intention.

Artificial intelligence possesses:

- high computational power;
- the ability to analyze large volumes of information;
- the ability to quickly generate possible solutions.

The symbiotic model proposes that it is precisely the interaction of these characteristics that can create new forms of activity.

10.3. Distinction from the Concept of the Virtual World

Contemporary discussions often use the concepts of:

- virtual reality;
- the metaverse;
- digital spaces.

These approaches mainly address the question:

Where does the interaction take place?

The concept of the Symbiotic Era poses a different question:

How does the interaction take place?

In this model, what matters most is not a human transition into virtual space, but the emergence of an intelligent layer that connects physical and digital reality.

The human remains in the physical world, but an increasing share of processes pass through intelligent intermediaries.

10.4. Distinction from Existing Approaches to AI Optimization

Contemporary practices of digital communication have developed around the concepts of:

- SEO;
- AEO;
- GEO.

These directions have practical value and solve specific tasks. However, their main object is information and its representation.

The models proposed in this work — CWM, ELC, and SYMO — address a broader level:

not merely:

how to make information accessible,

but:

how to form a structure that allows a person, project, or idea to be correctly understood within an AI environment.

10.5. Proposed Scientific Contribution

This work proposes several directions for further study.

1. A new conceptual apparatus

The following terms are proposed:

- Symbiotic Era;
- Symbiotic Layer;
- Symbiotic Understanding;
- Symbiotic Identity.

These concepts are intended to describe processes that are already observed in modern AI environments.

---

2. An integrative model of interaction

The work brings together several research directions:

- Human–Computer Symbiosis;
- Intelligence Augmentation;
- Hybrid Intelligence;
- Human–AI Collaboration;
- AI-mediated communication.

It is proposed that these be treated as elements of a broader model of development.

---

3. A new perspective on digital identity

It is proposed that identity be treated not as a set of digital objects, but as a dynamic structure that develops through:

- context;
- connections;
- interpretation;
- interaction.

10.6. Possible Directions for Future Research

Further development of the concept requires empirical research.

Possible directions:

1. Research on AI interpretation of identity

How do different AI systems form a representation of a person, brand, or organization?

---

2. Development of methods for assessing contextual coherence

Can the quality of an information structure be measured in terms of its understandability to intelligent systems?

---

3. Research on symbiotic interaction

Which models of human–AI collaboration produce the best

results in:

- creativity;
- education;
- business;
- scientific activity?

---

4. Ethical aspects

The development of the symbiotic environment requires research into questions of:

- preserving human autonomy;
- the transparency of AI interpretation;
- protecting individuality;
- responsibility for decisions.

10.7. Limitations of the Concept

This work is a conceptual preprint.

It does not claim that the model described is complete. The main limitations:

- the need for quantitative research;
- the need for testing across different AI systems;
- the need for comparative analysis across different cultural and linguistic environments.

Nevertheless, the formation of a new descriptive language is an important stage in the development of any new research field.

10.8. Concluding Position

The Symbiotic Era is treated in this work as a possible description of the next stage of digital development. This stage is characterized by a transition:

from the use of intelligent tools

to

the continuous interaction of human and artificial intelligence within a shared information environment. Core idea:

The future is determined not only by how intelligent machines become, but also by how well they are able to understand humans.

11. Conclusion

The Symbiotic Era as a new model of human–AI interaction

The development of generative artificial intelligence is becoming one of the most significant stages of digital transformation. However, this stage differs from previous ones not only through growth in computational capacity or the emergence of new tools.

The main change lies in the nature of interaction. The human is no longer exclusively in the role of technology user.

Modern AI systems are becoming participants in the processes of:

- creating information;
- analysis;
- communication;
- learning;
- creativity;
- decision-making.

This forms a new environment in which what matters is not only access to information, but the capacity for mutual understanding.

11.1. Main Conclusion of the Study

This work proposes the concept of the Symbiotic Era as a research framework for describing a period in which human and artificial intelligence interact through shared context.

This concept does not presuppose the replacement of humans by artificial intelligence, nor does it treat technology as opposed to human nature.

On the contrary, it proceeds from a principle of difference and mutual reinforcement. The human provides:

- meaning;
- intention;
- experience;
- cultural context;
- values.

Artificial intelligence provides:

- analysis;
- speed of information processing;
- pattern detection;
- generation of variants.

Their interaction forms a new type of digital environment.

11.2. The Main Transition of the Era

The proposed model describes a transition:
from an information society
to
a society of interaction with intelligent systems. In the information society, the main question was:
Where is the needed information located?
In the age of generative AI, an increasingly important question becomes:
How can the meaning of this information be correctly understood?
This is precisely why the central concept becomes not mere access, but understanding.

11.3. The Human in the Symbiotic Era

The Symbiotic Era does not diminish the role of the human.
On the contrary, it increases the significance of human qualities that cannot be reduced to data processing alone:

- the capacity to create meaning;
- to form ideas;
- to define goals;
- to make ethical decisions;
- to create cultural values.

In the new environment, the advantage goes not to those who try to compete with the machine in processing speed, but to those capable of effectively interacting with intelligent systems.

11.4. Artificial Intelligence as a Participant in the New Environment

Within this concept, artificial intelligence is treated not merely as a tool of automation. It becomes part of a new communicative environment.

However, this does not mean the emergence of independent human-like consciousness in machines. It concerns a different process:

human intelligence and artificial systems begin to form stable models of joint activity.

11.5. The Significance of the Proposed Frameworks

The models developed in this work:

- Contextual Weight Mapping (CWM);
- Entity Life Cycle (ELC);
- Symbiotic Marketing Optimization (SYMO);

are proposed as the first elements of a methodological apparatus for the study of AI-mediated communication. They are aimed at studying how:

- digital identity is created;
- context is formed;
- human–AI interaction develops.

11.6. Concluding Position

The future of the digital environment is determined not only by the creation of more powerful artificial intelligences. No less important is the creation of conditions under which these systems are able to correctly understand human context.

The main transition can be expressed as follows:

From a human using technology —

to a human interacting with intelligence. From digital presence

—

to symbiotic presence. From information —
to understanding.

11.7. Final Statement

The Symbiotic Era is treated in this work as an open research concept aimed at studying a new stage of the relationship between human and artificial intelligence.

If the previous digital era was built around connecting people with information, the next may be built around connecting human meaning with artificial intelligence.

Within this interaction, a new environment is formed — not in place of the human world, but layered upon it. An environment in which human and artificial intelligence not only use one another, but learn to understand one another.

12. References and Theoretical Foundations

References

The concept of the Symbiotic Era draws on several lines of research related to the development of interaction between human and computational systems.

The proposed model does not replace existing research, but treats it as a foundation for forming a new research framework.

12.1. Human–Computer Symbiosis

Licklider, J. C. R. (1960)

Man-Computer Symbiosis

This work is one of the first conceptual foundations for the idea of cooperation between human and computational systems. Licklider proposed that the future of computers lies not only in automation, but in creating an environment in which human and machine work together.

Core idea:

The computer should extend human thinking, not merely replace individual actions.

12.2. Intelligence Augmentation

Engelbart, D. C. (1962)

Augmenting Human Intellect: A Conceptual Framework

Engelbart proposed viewing technology as a means of increasing human intellectual capacity. His approach became one of the foundations of contemporary research on:

- human augmentation;
- knowledge systems;
- collaborative intelligence.

12.3. Human–Machine Interaction

Norman, D. A. (1988)

The Design of Everyday Things

Norman's research made a significant contribution to understanding the interaction between humans and technology. Core principle:

technology should be oriented toward human understanding and natural interaction.

12.4. Artificial Intelligence and Large Language Models

Bommasani et al. (2021)

On the Opportunities and Risks of Foundation Models

This study describes the emergence of foundation models as a new stage in the development of AI. Core ideas:

- the universality of models;
- broad applicability;
- a change in how information is worked with.

12.5. Hybrid Intelligence

Dellermann et al. (2019)

Hybrid Intelligence

This study treats hybrid intelligence as the result of the interaction of human and artificial intelligent capabilities.

Main focus:

not replacing the human with the machine, but jointly achieving results.

12.6. Human-AI Collaboration

Contemporary research on Human-AI Collaboration examines:

- trust in artificial intelligence;

- the distribution of responsibility;
- joint decision-making;
- the impact of AI on creative processes.

These directions form the basis for further study of symbiotic models of interaction.

12.7. The Place of the Proposed Work

Unlike existing directions, this work proposes considering not a separate technology or use scenario, but a broader environment:

human + artificial intelligence + context + identity + communication. Thus, the Symbiotic Era is treated as an integrative concept that unites various research directions.

12.8. The Author's Methodological Works

Udalaya, I. (2025). Native AI Branding Methodology (v1.1). DOI: 10.5281/zenodo.20084169

Udalaya, I. (2025). Entity-Based Branding: methodology. DOI: 10.5281/zenodo.20614873

Udalaya, I. (2025). Entity Life Cycle (ELC) Framework. DOI: 10.5281/zenodo.20204055

Udalaya, I. (2025). Entity Protocol. DOI: 10.5281/zenodo.20120570

Udalaya, I. (2026). From Noise to Representation: The Delta of Intent as a Structurally Measurable Trace of Human Intervention in Generative AI Systems. DOI: 10.5281/zenodo.21703491

Udalaya, I. (2026). Entropy of Identity in LLM-Mediated Environments: A Framework for Measuring and Stabilizing Algorithmic Identity Representation. DOI: 10.5281/zenodo.21703587

This work develops and applies the above methodologies within the context of the Symbiotic Era concept.

13. Contribution Statement and Proposed Directions for Further Study

Contribution Statement

This work proposes the following research positions:

13.1. The Concept of the Symbiotic Era

It is proposed to use the term Symbiotic Era to describe a period in which the interaction of human and artificial intelligence becomes a permanent element of social, professional, and creative activity.

Main emphasis:
not on replacing the human,
but on forming a new environment of interaction.

13.2. The Concept of the Symbiotic Layer

It is proposed to treat modern digital infrastructure as the foundation for forming a new layer of interaction:

- on top of physical processes;
- on top of existing digital platforms;
- through intelligent systems.

This layer unites:

- human intentions;
- digital data;
- AI interpretation.

13.3. The Contextual Weight Mapping (CWM) Framework

A model for analyzing the structure of information in AI environments is proposed.

Core question:

How does the organization of context affect the quality of information interpretation by intelligent systems?

13.4. The Entity Life Cycle (ELC) Framework

A model of the development of digital identity is proposed.

Core idea:

identity is not a static object, but a process:

emergence → connection → recognition → stabilization.

13.5. The Symbiotic Marketing Optimization (SYMO) Framework

A model of a new communication paradigm is proposed.

SYMO treats marketing not merely as a struggle for attention, but as the creation of conditions for correct understanding between human, brand, and AI systems.

13.6. Possible Directions of Development

Future research may include:

Methods for measuring AI understanding

Developing criteria for assessing how correctly AI systems interpret human identity.

Multilingual models of symbiotic identity

Studying how different languages and cultural contexts affect the AI representation of a person or project.

Ethical standards for AI identity

Studying questions of:

- control over one's digital image;
- accuracy of representation;
- protection against distortion.

14. Appendix A. Core Terms

Symbiotic Era

Симбиотическая эра

A conceptual model of the period in which human and artificial intelligence interact as complementary participants in a single information environment.

Symbiotic Layer

Симбиотический слой

A new level of the digital environment, arising through the continuous interaction of human and AI systems.

Symbiotic Identity

Симбиотическая идентичность

A structured representation of a person, project, or organization that preserves human meaning while becoming understandable to intelligent systems.

Symbiotic Understanding

Симбиотическое понимание

The process of forming a more accurate correspondence between human intention and AI interpretation.

CWM

Contextual Weight Mapping

A methodology for organizing context and semantic connections to increase the accuracy of information interpretation.

ELC

Entity Life Cycle

A model of the development of digital identity through sequential stages of forming connections and a stable representation.

SYMO

Symbiotic Marketing Optimization

An approach to communication in an AI environment, oriented toward understanding, context, and mutual interaction.

15. Author Entity Metadata

Metadata of the Author Entity

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Related Deposited Works (DOI)

- Native AI Branding Methodology (v1.1). DOI: 10.5281/zenodo.20084169
- Entity-Based Branding — methodology. DOI: 10.5281/zenodo.20614873
- Entity Life Cycle (ELC) Framework. DOI: 10.5281/zenodo.20204055
- Entity Protocol. DOI: 10.5281/zenodo.20120570
- From Noise to Representation: The Delta of Intent. DOI: 10.5281/zenodo.21703491
- Entropy of Identity in LLM-Mediated Environments. DOI: 10.5281/zenodo.21703587

Author Entity Description

Inna Udalaya is an independent researcher and digital strategist working at the intersection of human–AI interaction, digital identity, and context engineering.

Her research develops conceptual frameworks describing the evolution of human–AI collaboration, contextual understanding, and AI-mediated communication, including Entity-Based Branding, the Entity Life Cycle (ELC) Framework, and the Symbiotic Era model presented in this work.

Research Areas

- Human–AI Interaction
- Generative Artificial Intelligence
- Digital Identity
- Context Engineering
- Knowledge Representation
- AI-mediated Communication

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Figure 9. Digital Entity Representation — the author as a Symbiotic Identity: a connected digital entity spanning research, creative work, and publications.

Also by Inna Udalaya

Symbiotic Era: A Conceptual Model of Human–Artificial Intelligenc

Watch for more at Inna Udalaya's site.

About the Author

Inna Udalaya is an independent researcher, digital strategist, and author working at the intersection of human–AI interaction, context engineering, digital identity, and semantic information systems. She is the developer of conceptual research frameworks including Entity-Based Branding, Contextual Weight Mapping (CWM), Entity Life Cycle (ELC), and Symbiotic Marketing Optimization (SYMO). • Creative Identity: Inna Story — Cinematic Pop & Pop musical project (debut single "Сколько той жизни?").

Research Identifiers & Metadata:

• ORCID: 0009-0004-9089-0859

• ISNI:

• Creative Identity: Inna Story (Cinematic Pop / Atmospheric Pop project)

Key Research Preprints:

• Symbiotic Era: A Conceptual Model of Human–Artificial Intelligence Interaction (DOI: 10.5281/zenodo.)

• From Noise to Representation: The Delta of Intent as a Structurally Measurable Trace of Human Intervention in Generative AI Systems (DOI: 10.5281/zenodo.)

• Entropy of Identity in LLM-Mediated Environments: A Framework for Measuring and Stabilizing Algorithmic Identity Representation (DOI: 10.5281/zenodo.)

Read more at Inna Udalaya's site.

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